SKILLS for the FUTURE
WISCONSIN
YOUTH APPRENTICESHIP

Manufacturing/Machining
Skill Standards Checklist

CERTIFICATION AREAS COMPLETED:

____ Core Abilities

____ Manufacturing Fundamentals

____ Machine Tool Concepts

____ Advanced Machining Concepts

____ Introduction to CNC & Manufacturing Careers

____ A minimum of 900 work hours

Level One Requirements: Complete Core Abilities and <u>two</u> of the certification areas above.
A minimum of 450 work hours.

Student Name_____

School District_____

YA Consortium_____

YA Coordinator_____

High School Diploma/GED/HSED

Date Received_____

Total Hours Employed	**Company Name**	**Phone #**

Instruction for the Worksite Mentor

The Skill Standards Checklist is a list of competencies (tasks) to be achieved through mentoring at the worksite.

- Each competency has three levels.
- The worksite mentor should rate each competency as the student acquires and demonstrates the skill.
- A competency may be revisited and the score raised as the student becomes more proficient at the worksite.
- The mentor and the student should go over the checklist together on a regular basis (at a minimum every 9 weeks) to record progress and plan future steps to complete the required competencies.

Please sign this page if you have been a mentor, trainer or instructor of this student.

CERTIFICATION: I certify that this student has successfully completed the competencies required in my department.

_____ **Mentor/Trainer Signature** _____ Printed Name

_____ Department _____ Date Signed

_____ **Mentor/Trainer Signature** _____ Printed Name

_____ Department _____ Date Signed

_____ **Mentor/Trainer Signature** _____ Printed Name

_____ Department _____ Date Signed

_____ **Mentor/Trainer Signature** _____ Printed Name

_____ Department _____ Date Signed

_____ **Mentor/Trainer Signature** _____ Printed Name

_____ Department _____ Date Signed

_____ **Instructor Signature** _____ Printed Name

_____ Department _____ Date Signed

_____ **Instructor Signature** _____ Printed Name

_____ Department _____ Date Signed

Core Abilities Required

Core abilities address broad knowledge, skills, and attitudes that go beyond the context of a specific course. These standards are not taught in specific lessons. These are the employability skills that are critical for success in the Manufacturing industry.

RATING:

3 = Consistently displays this behavior

2 = Often displays this behavior

1 = Rarely displays this behavior

		Score		
1.	Communicates clearly with supervisor and others	3	2	1
2.	Acts professionally	3	2	1
3.	Learns effectively	3	2	1
4.	Manages self responsibly	3	2	1
5.	Plans for changes (flexibility and adaptability)	3	2	1
6.	Plans for personal and professional growth	3	2	1
7.	Works productively	3	2	1
Safety				
*8.	Recognizes safe and unsafe procedures	*3	2	1
*9.	Demonstrates proper safety procedures	*3	2	1
*10.	Maintains a safe and healthy work environment	*3	2	1

All competencies in this section must be rated 2 or higher
All * items must be completed at a 3 rating

Comments: _____

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Manufacturing Fundamentals

RATING:

3 = Able to perform entry level skills. Has performed task during training program; limited additional training may be required

2 = Has performed job during training program; additional training is required to develop entry level skills.

1 = Is familiar with process, no opportunity to perform during training program or unable to perform task with entry level skill.

	Score
1. Identify Manufacturing Occupations (1.1)	3 2 1
2. Recognize unsafe work habits (2.1)	3 2 1
3. Utilize personal safety equipment (2.2)	3 2 1
4. Identify hazards associated with machines and tooling (2.3)	3 2 1
5. Identify rules and their applications (3.1)	3 2 1
6. Read a steel rule and combination square set (3.2)	3 2 1
7. Identify micrometer instruments and their application (3.3)	3 2 1
8. Measure with micrometer instruments (3.4)	3 2 1
9. Use semi-precision and precision layout tools (3.5)	3 2 1
10. Identify vernier instruments and their application (3.6)	3 2 1
11. Assess need for blueprints in industry (4.1)	3 2 1
12. Identify lines on a blueprint (4.2)	3 2 1
13. Identify arrangement of views on a blueprint (4.3)	3 2 1
14. Sketch a three view orthographic drawing (4.4)	3 2 1
15. Interpret dimensions and tolerance on blueprints (4.5)	3 2 1
16. Identify cutting and non-cutting hand tools (5.1)	3 2 1
17. Identify sawing machines and their applications (6.1)	3 2 1
18. Identify pedestal (bench) grinders and their applications (6.2)	3 2 1
19. Identify drill presses and their applications (6.3)	3 2 1
20. Identify vertical milling machines and milling machine safety (6.4)	3 2 1
21. Identify an engine lathe and engine lathe safety (6.5)	3 2 1

Total # of items completed with a 2 or higher rating _____ (19 required to pass this section)

COMMENTS:_____

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Machine Tool Concepts

RATING:

3 = Able to perform entry level skills. Has performed task during training program; limited additional training may be required

2 = Has performed job during training program; additional training is required to develop entry level skills.

1 = Is familiar with process, no opportunity to perform during training program or unable to perform task with entry level skill.

	Score
1. Identify motions between tool and workpiece (1.1)	3 2 1
2. Identify chip cutting theory and machineability (1.2)	3 2 1
3. Determine importance of cutting fluids (2.1)	3 2 1
4. Identify types of cutting fluids and application methods (2.2)	3 2 1
5. Identify variables for milling cutter speeds and feeds (3.1)	3 2 1
6. Identify setups and adjustments of a vertical milling machine (3.2)	3 2 1
7. Demonstrate climb and conventional milling on a vertical mill (3.3)	3 2 1
8. Identify and utilize various types of milling cutters (3.4)	3 2 1
9. Set up and perform a facing operation in a 3 jaw chuck (4.1)	3 2 1
10. Set up and perform a turning operation between centers (4.2)	3 2 1
11. Set up and perform a drilling operation in a 4 jaw chuck (4.3)	3 2 1
12. Set up and perform a boring operation in a collet chuck (4.4)	3 2 1
13. Identify types of grinding wheels and their applications (5.1)	3 2 1
14. Describe the function of a horizontal spindle, reciprocating table, surface grinder (5.2)	3 2 1
15. Set up and operate a surface grinder (5.3)	3 2 1
16. Identify materials using SAE and AISI coding systems (6.1)	3 2 1
17. Identify materials utilizing basic tests (6.2)	3 2 1
18. Identify ferrous and non-ferrous metals (6.3)	3 2 1
19. Identify and machine plan carbon steel and aluminum (6.4)	3 2 1
20. Identify what affects steel during heat treatment (7.1)	3 2 1
21. Peform heat treating procedures (7.2)	3 2 1
22. Develop a process plan for a part from a blueprint (8.1)	3 2 1

Total # of items completed with a 2 or higher rating _____ (20 required to pass this section)

COMMENTS:_____

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Advanced Machining Concepts

RATING:

3 = Able to perform entry level skills. Has performed task during training program; limited additional training may be required

2 = Has performed job during training program; additional training is required to develop entry level skills.

1 = Is familiar with process, no opportunity to perform during training program or unable to perform task with entry level skill.

	Score
1. Interpret threads, tapers and shop notes on engineering drawings (1.1)	3 2 1
2. Identify metric engineering drawings (1.2)	3 2 1
3. Interpret section view drawings (1.3)	3 2 1
4. Identify geometry dimensioning and tolerancing and computer assisted drawing components (1.4)	3 2 1
5. Perform angular milling operations (2.1)	3 2 1
6. Perform metric positioning on a milling machine (2.2)	3 2 1
7. Utilize a dividing head fixture (2.3)	3 2 1
8. Calculate pregrinding tolerances (2.4)	3 2 1
9. Identify and operate an offset boring head on a vertical mill (2.5)	3 2 1
10. Utilize radius and profiling tools (3.1)	3 2 1
11. Utilize carbide turning tools (3.2)	3 2 1
12. Perform knurling and taper operations (3.3)	3 2 1
13. Identify thread information and calculations (3.4)	3 2 1
14. Produce a threaded part on a lathe (3.5)	3 2 1
15. Surface grind multiple pieces to specific tolerances (4.1)	3 2 1
16. Surface grind a slot to specified tolerances (4.2)	3 2 1
17. Identify the process of electrical discharge machining (EDM) (5.1)	3 2 1

Total # of items completed with a 2 or higher rating _____ (15 required to pass this section)

COMMENTS:_____

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Introduction to CNC & Manufacturing Careers

RATING:

3 = Able to perform entry level skills. Has performed task during training program; limited additional training may be required

2 = Has performed job during training program; additional training is required to develop entry level skills.

1 = Is familiar with process, no opportunity to perform during training program or unable to perform task with entry level skill.

	Score
1. Define computer aided drawing (CAD) (1.1)	3 2 1
2. Identify computer hardware and software (1.2)	3 2 1
3. Identify differences between manual and CAD applications (1.3)	3 2 1
4. Identify types of CNC machine tools and axis movements (1.4)	3 2 1
5. List steps needed to produce a part by CNC and write a simple program (1.5)	3 2 1
6. Identify advantages and disadvantages of CNC (1.6)	3 2 1
7. Identify various types of metal stamping and forming dies (2.1)	3 2 1
8. Identify components of a metal stamping die (2.2)	3 2 1
9. Identify parts and materials produced by metal stamping and forming and design a process plan for a metal stamped part (2.3)	3 2 1
10. Identify various types of plastic molds and processes (3.1)	3 2 1
11. Identify components of plastic molds (3.2)	3 2 1
12. Identify materials and parts produced by the molding process and design a process plan for a plastic molded part. (3.3)	3 2 1
13. Identify die cast molds and processes (4.1)	3 2 1
14. Identify components of die cast molds (4.2)	3 2 1
15. Identify parts produced by the die cast process and design a process plan for a die cast part (4.3)	3 2 1
16. Read care and maintenance manuals for various machine tools (5.1)	3 2 1
17. Perform minor preventive maintenance on a machine tool (5.2)	3 2 1

Total # of items completed with a 2 or higher rating _____ (15 required to pass this section)

COMMENTS:_____

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Special Projects or Certifications

Instructor/Mentor Comments:

Instructor/Mentor Signature

Date Signed

Notes